

CLAIMS

1. A process for transmitting data between at least one transmitter (1) and at least one receiver (2), in the form of packets of at least one datum, each of said data packets being associated with an identifier of said packet,

characterised in that it implements at least two transmission modes:

- an explicit mode (12; 22), wherein each of said data packets, called explicit packets, is transmitted with said identifier of said data packet;

- an implicit mode (11; 21), wherein said data packets, called implicit packets, are transmitted without being accompanied by said identifiers;

and in that it includes at least one transfer stage (24; 14) from said explicit mode to said implicit mode and/or at least one transfer stage (23; 13) from said implicit mode to said explicit mode, as a function of at least one pre-determined transfer criterion.

2. A process according to claim 1, characterised in that said receiver (2) maintains at least one of the variables belonging to the group including:

- variables (561, 551; 572, 552) relating to said identifiers of said data packets;

- an error flag relating to said data transmission;

- state variables relating to an implemented protocol.

3. A process according to claim 2, characterised in that said error flag may take at least two states:

5       - a "raised" state after said receiver (2) receives an error message;

      - a "lowered" state after said receiver correctly receives an explicit packet.

4. A process according to claim 3, characterised in  
10 that said receiver (2) being in explicit mode (22), said error flag being raised, said receiver rejects all implicit packets received.

5. A process according to claim 3, characterised in that said receiver (2) being in explicit mode (22) and  
15 receiving at least one implicit packet, said error flag being raised, said receiver implements the following successive stages:

      - said receiver stores, according to a sequential order of storage, said at least one received implicit  
20 packet;

      - if said error flag remains in the "raised" state, said receiver rejects said at least one stored implicit packet;

      - if said error flag passes to the "lowered" state,  
25 said receiver processes said at least one stored implicit packet and assigns to it the identifier which sequentially precedes said identifier of said received explicit packet, if it is the first stored implicit packet, or the identifier which sequentially precedes  
30 the identifier of the previously stored implicit packet according to said sequential order of storage.

6. A process according to any one of claims 3 to 5, characterised in that the transfer (24) of said receiver  
(2) from said explicit mode (22) to said implicit mode  
35 (21) is triggered by the receipt of an implicit packet, provided that said error flag is in the "lowered" state,

and in that said transfer from said implicit mode to said explicit mode (23) is triggered by the receipt of an explicit packet and/or an error message.

7. A process according to any one of claims 1 to 6, characterised in that said receiver (2) having correctly received a data packet, it sends to said transmitter (1) at least one conventional acknowledgement message of said received packet, containing said identifier of said next data packet expected by said receiver,

and in that, in at least some cases, said receiver, prior to said dispatch of said at least one conventional acknowledgement message, sends to said transmitter at least one advance acknowledgement message.

8. A process according to any one of claims 1 to 7, characterised in that said transmitter (1) maintains at least one of the variables belonging to the group including:

- variables (51, 52) relating to identifiers of at least some of said transmitted packets;
- for each of said transmitted packets, a clock being able to take at least three states:
  - an "in progress" state, after sending of said transmitted packet;
  - a "stopped" state, after receipt of an acknowledgement message of said transmitted packet;
  - an "expired" state, after a pre-determined maximum time;
- state variables relating to an implemented protocol.

9. A process according to any one of claims 1 to 8, characterised in that the transfer (14) of said transmitter (1) from said explicit mode (12) to said implicit mode (11) is triggered by an event internal and/or external to said transmitter, if at least one explicit packet has been sent by said transmitter since

the last transfer of said transmitter from said implicit mode to said explicit mode.

10. A process according to any one of claims 1 to 9, characterised in that said transmitter maintains  
5 additionally at least one of the variables belonging to the group including:

- a first identification variable (52), called EoW, whose value is an identifier of said next packet to be transmitted;

- 10 - a second identification variable (51), called BoW, whose value is the smallest of said identifiers of said transmitted packets, for which said transmitter has not received an acknowledgement message, said identifier being a number, assigned sequentially to each of said  
15 data packets.

11. A process according to claims 8 and 9, and possibly according to claim 10, characterised in that said identifier is a number, assigned sequentially to each of said data packets,

20 and in that said event is constituted by the combination of the following conditions:

- said transmitter receives an acknowledgement message containing the identifier N of the next data packet expected by said receiver;

- 25 - said clock of each of said packets with identifiers SN transmitted by said transmitter is either in said "in progress" state, or in said "stopped" state, SN being greater than or equal to N, and SN being strictly lower than the identifier of said next packet  
30 to be transmitted (EoW).

12. A process according to claim 8, and possibly any one of claims 9 to 11, characterised in that said identifier is a number, assigned sequentially to each of said data packets,

35 and in that the transfer (13) of said transmitter (1) from said implicit mode (11) to said explicit mode

(12) is triggered by receipt of an acknowledgement message containing the identifier N of said next data packet expected by said receiver, if the two following conditions are confirmed:

- 5       - said transmitter has transmitted at least one packet with identifier SN, with SN greater than or equal to N, and SN strictly lower than the identifier of said next packet to be transmitted;
- said clock of one at least of said packets with  
10 identifier SN is in the "expired" state.

13. A process according to claims 8 and 10, and possibly according to claim 11, characterised in that said identifier is a number, assigned sequentially to each of said data packets,

- 15       and in that the transfer (13) of said transmitter (1) from said implicit mode (11) to said explicit mode (12) is triggered by the transfer of said clock of a packet with identifier SN into said "expired" state, SN being greater than or equal to said second  
20 identification variable BoW, and strictly lower than said first identification variable EoW.

- 14. A process according to any one of claims 1 to 13, characterised in that said explicit mode implements a protocol of the Automatic Repeat Request  
25 (ARQ) type.

15. A process according to claim 14, characterised in that said ARQ type protocol belongs to the group including:

- protocols of the Go-back-N type;
- 30       - protocols of the Selective Repeat type;
- protocols of the Stop-and-Wait type.

- 16. A system for transmitting data exchanged between at least one transmitter (1) and at least one receiver (2), in the form of packets of at least one  
35 datum, each of said data packets being associated with an identifier of said packet,

characterised in that it includes at least two transmission modes:

- an explicit mode (12; 22), wherein each of said data packets, called explicit packets, is transmitted  
5 with said identifier of said data packet;

- an implicit mode (11; 21), wherein said data packets, called implicit packets, are transmitted without being accompanied by said identifiers;

and in that it implements transfer means (24; 14)  
10 from said explicit mode to said implicit mode and/or transfer means (23; 13) from said implicit mode to said explicit mode, as a function of at least one pre-determined transfer criterion.

17. A transmitter (1) of a data transmission  
15 system, of the type making it possible to exchange data with at least one receiver (2), in the form of packets of at least one datum, each of said data packets being associated with an identifier of said packet,

characterised in that it operates according to at  
20 least two data transmission modes:

- an explicit mode (12), wherein each of said data packets, called explicit packets, is transmitted with said identifier of said data packet;

- an implicit mode (11), wherein said data packets,  
25 called implicit packets, are transmitted without being accompanied by said identifiers;

and in that it includes transfer means (14) from said explicit mode to said implicit mode and/or transfer means (13) from said implicit mode to said explicit  
30 mode, as a function of at least one pre-determined transfer criterion.

18. A receiver (2) of a data transmission system, of the type making it possible to exchange data with at least one transmitter (1), in the form of packets of at  
35 least one datum, each of said data packets being associated with an identifier of said packet,

- an explicit mode (22), wherein each of said data packets, called explicit packets, is transmitted with  
5 said identifier of said data packet;

and in that it includes transfer means (24) from  
10 said explicit mode to said implicit mode and/or transfer  
means (23) from said implicit mode to said explicit  
mode, as a function of at least one pre-determined  
transfer criterion.